

ARTIMIS Partnerships



for the
2002 NATMEC
in Orlando, Florida
by
Rob Bostrom, P.E.
Division of
Multimodal Programs

Presentation Overview

- ARTIMIS - Background/FAQs
- Archived Data
 - Original Archived Data Plan
 - Revised Archived Data Plan
 - Related Data Archiving Activities
- Future Directions

A map of the Cincinnati-Northern Kentucky Region. The map shows the Ohio River flowing through the center, with Cincinnati, Ohio, on the north bank and Northern Kentucky on the south bank. Major highways are depicted with colored lines and shields: red for Interstates (I-75, I-475, I-275, I-74, I-76), blue for State Routes (SR-50, SR-127, SR-125, SR-126, SR-128, SR-129, SR-131, SR-132, SR-133, SR-134, SR-135, SR-136, SR-137, SR-138, SR-139, SR-140, SR-141, SR-142, SR-143, SR-144, SR-145, SR-146, SR-147, SR-148, SR-149, SR-150, SR-151, SR-152, SR-153, SR-154, SR-155, SR-156, SR-157, SR-158, SR-159, SR-160, SR-161, SR-162, SR-163, SR-164, SR-165, SR-166, SR-167, SR-168, SR-169, SR-170, SR-171, SR-172, SR-173, SR-174, SR-175, SR-176, SR-177, SR-178, SR-179, SR-180, SR-181, SR-182, SR-183, SR-184, SR-185, SR-186, SR-187, SR-188, SR-189, SR-190, SR-191, SR-192, SR-193, SR-194, SR-195, SR-196, SR-197, SR-198, SR-199, SR-200, SR-201, SR-202, SR-203, SR-204, SR-205, SR-206, SR-207, SR-208, SR-209, SR-210, SR-211, SR-212, SR-213, SR-214, SR-215, SR-216, SR-217, SR-218, SR-219, SR-220, SR-221, SR-222, SR-223, SR-224, SR-225, SR-226, SR-227, SR-228, SR-229, SR-230, SR-231, SR-232, 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SR-983, SR-984, SR-985, SR-986, SR-987, SR-988, SR-989, SR-990, SR-991, SR-992, SR-993, SR-994, SR-995, SR-996, SR-997, SR-998, SR-999, SR-1000. The map also shows the location of the ARTIMIS project area, which is highlighted in green and yellow. The project area is located in the Cincinnati-Northern Kentucky Region, covering a large area of the Ohio River and surrounding highways. The map includes labels for 'INDIANA', 'OHIO', 'KENTUCKY', 'Cincinnati', 'RRCC', 'Test Bed', 'Ohio River', and 'Center'. A compass rose is visible in the bottom left corner.

ARTIMIS: Background

- The Advanced Regional Traffic Interactive Management & Information System
- Cincinnati-Northern Kentucky Region
- Incident, congestion & freeway management
- 88 miles of highways
- Started in 1995, Feasibility Study in 1987,
- Preliminary Design in 1993
- 1st major ITS effort in Ohio & 2nd in KY



ARTIMIS

The Advanced Regional Traffic Interactive Management & Information System

- Policy Committee: KYTC, ODOT, OKI, Cincy, NKY Plan Comm., FHWA
- Funded primarily via CMAQ, also CVS (vans),
- 80+ cameras, 57 miles fiber, 1100 detectors, 40 fixed DMSs, 2 HARs, 5 patrol vans, Control Center in Downtown Cincy
- Travel Advisory Number: 511
- Web site: **<http://www.artimis.org/>**

ARTIMIS Goals

- Improving
 - motorist safety
 - travel times
 - air quality

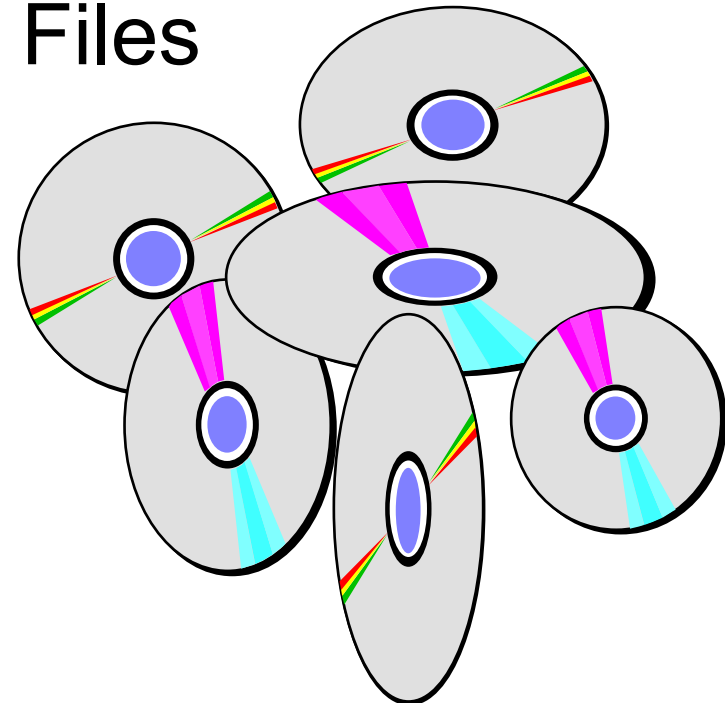


Traffic Conditions



Archived Data Plan

- Original Plan
 - Card 3 (FHWA Traffic Volume)
 - Card C (FHWA Vehicle Classification)
- Also Segment and Incident Files
- Data Provided via CD
- No real quality control



Current Data Files

- **Card 3 File:** Volume by direction/lane for all locations per hour in FHWA format
- **Segment File:** Speed, volume, occupancy, sample percentage per 15 minutes, 24-hour file
- **Incident Snapshot File:** Speed, volume, occupancy per 30 seconds, 15-minute file
- **Card C File:** Vehicle classification by direction/lane per hour.



Traffic Monitoring Guide



U.S. Department of Transportation
Federal Highway Administration

Office of Highway Policy Information

Additions to Original Plan

- Data available at ftp site for each month: *ftp://208.237.57.131/*
- Vehicle classification data collection with axle sensors failing
- High amount of missing data due to loop failures and polling failures
- Card 3 has construction flag in last field
- Analysis primarily with Excel & SAS

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Revised Data Archiving Plan

- New Data Formats
 - V Card
 - S Card
 - L Card
- Computer Programming
 - Pre Designed Queries & Reports
- Data Web Page
- Data Collection Investigation: 170s vs. TMS equipment
- GIS Coverage

New Data Cards

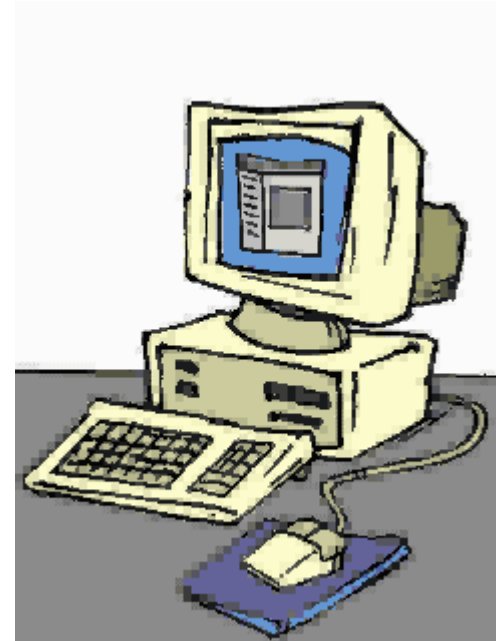
- New data cards may be basis for other ITS systems in KY & OH & other states(?)
- L-Card
 - Length-based vehicle classification
 - 24 sites with double loops
 - Data in 60-minute increments by lane
 - KYTC may convert to 13-bin FHWA format for submittal to OHPI

Length Based Classification Boundaries

Primary Description of Vehicles Included in the Class	Lower Length Bound	Upper Length Bound
	>	< or =
Passenger vehicles (PV)	0 m (0 ft)	3.96 m (13 ft)
Single unit trucks (SU)	3.96 m (13 ft)	10.67 m (35 ft)
Combination trucks (CU)	10.67 m (35 ft)	18.59 m (61 ft)
Multi-trailer trucks (MU)	18.59 m (61 ft)	36.58 m (120 ft)

New Data Cards

- S-Card
 - Speed data
 - Data in 60-minute increments
- V-Card
 - Volume data
 - Similar to existing Card 3 format
 - Data in 5-minute increments by lane
 - Use of TTI quality control checks



Revised Data Archiving Plan

- Computer programming
 - Create new data formats
 - Create pre-designed queries/reports
- Data web page
 - Queries/reports for historical data
 - ADTs
 - Truck percentages
 - Speed summaries
 - Queuing/delay data
 - Downloads
 - Good example:



Revised Data Archiving Plan

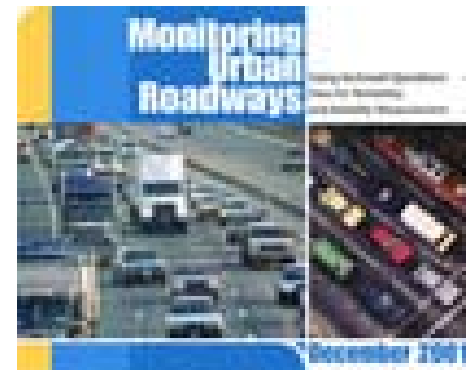
- Equipment Investigation
 - 170s not good on classification data
 - Use off the shelf traffic counter
 - Need to collect occupancy data
- GIS Coverage
 - Spatial analysis could maximize value of archived data
 - Obstacles: different software (3 different agencies), Operations typically doesn't use GIS

Related Data Archiving Activities

- **Mobility Monitoring Study:** TTI & Cambridge Systematics
- **ASTM Standards:** Development of Traffic Monitoring Archived Data Standards
- **FHWA Analysis of ARTIMIS Data:** Office of Highway Policy Information
- **Feedback to Other ITS Systems in Area:** TRIMARC, Central Kentucky
- **Research:** KYTC on archived data; TRB (maybe) on speed monitoring

Mobility Monitoring Study

- FHWA Sponsored, Research by TTI and Cambridge Systematics
- Real-time traffic data from 10 TOCs in 2000 including ARTIMIS
- Production of mobility and reliability measures
- Cambridge also did SAS analysis of traffic volumes for KYTC
- [**http://mobility.tamu.edu/mmp/**](http://mobility.tamu.edu/mmp/)



Mobility Monitoring Study

- Quality feedback
 - Data 42% complete
 - Data processed 38% complete
- Performance measures likely to supplement traditional v/c ratio in KY

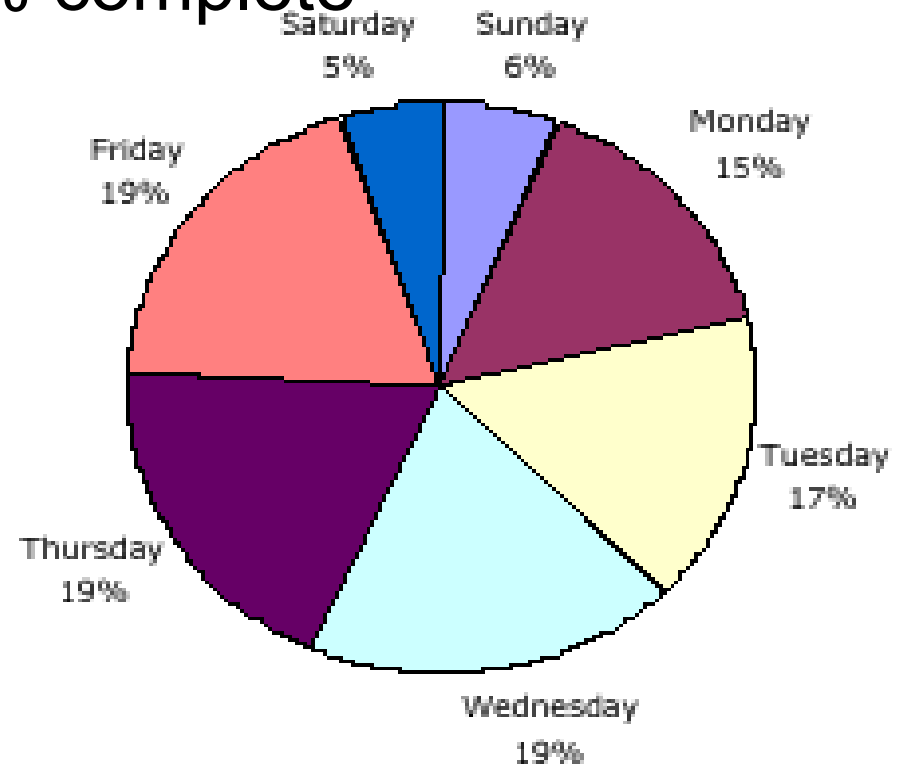


Exhibit B-5. Delay by Day of Week

Mobility and Reliability Data

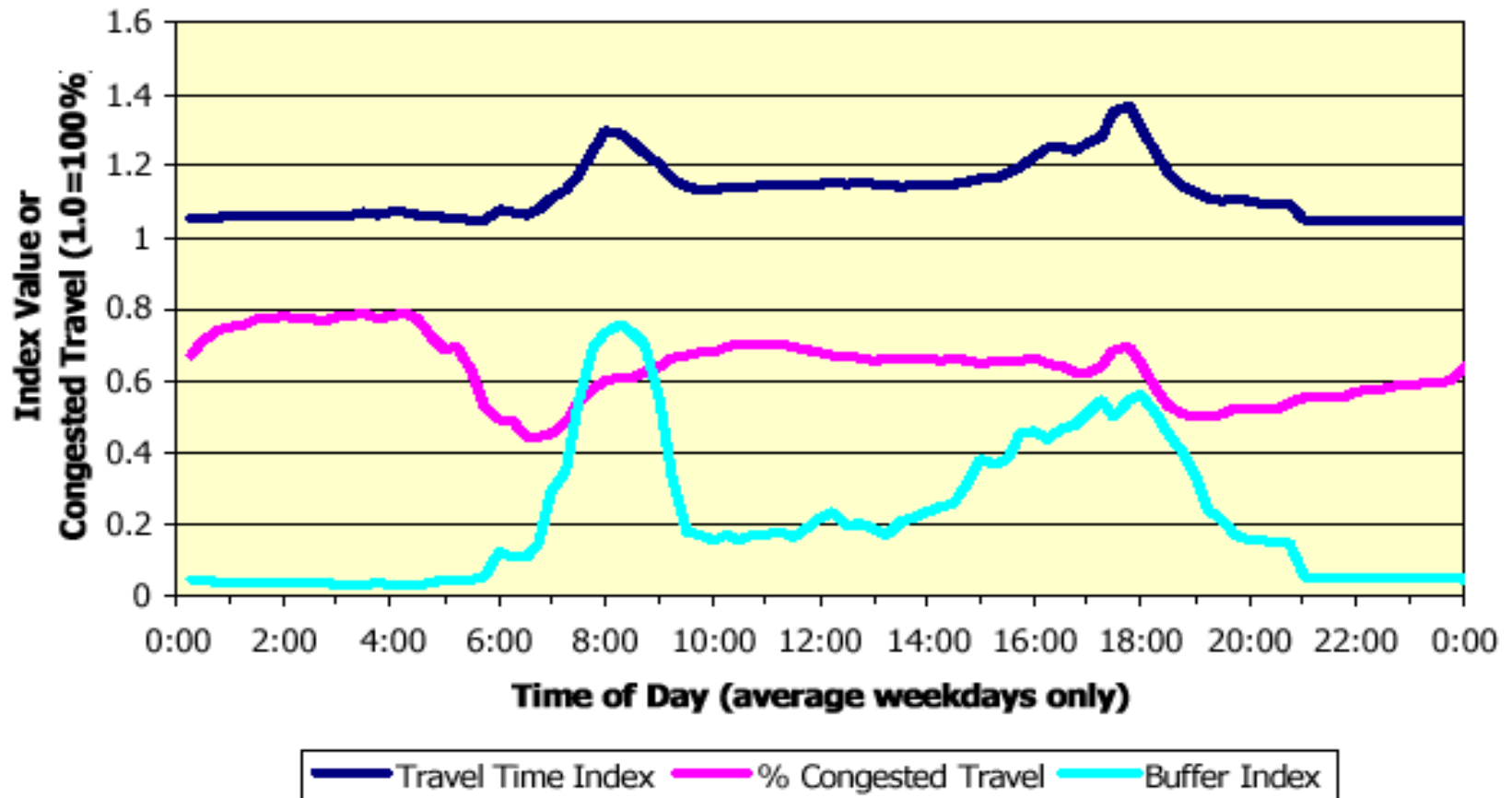


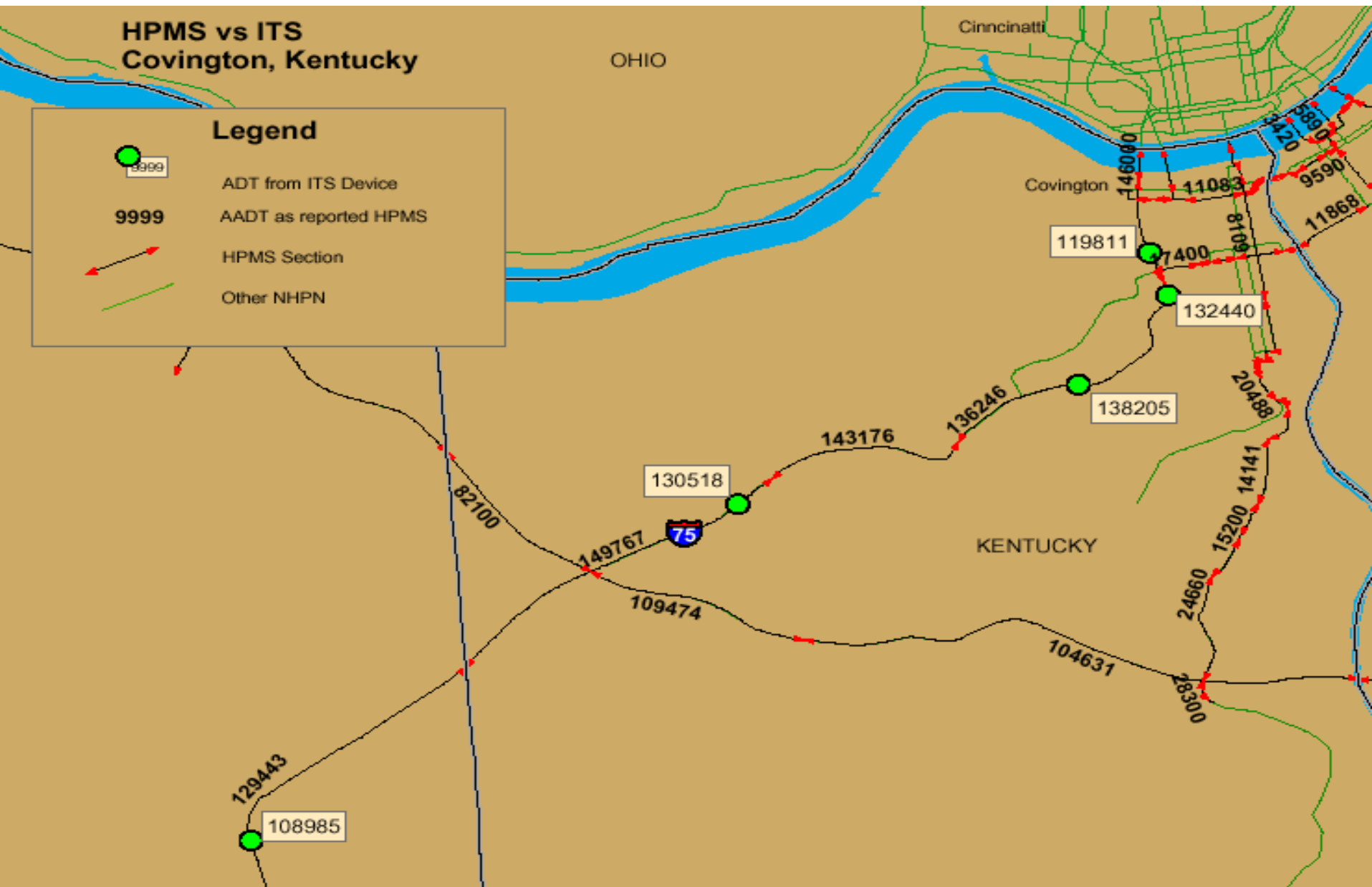
Exhibit B-7. Mobility and Reliability Measures by Time of an Average Day

ASTM Guide for ITS Data Archiving

- Benefits of data archiving
- Data definitions
- Quality standards
- Audiences:
 - Novice/decision maker
 - Intermediate
 - Advanced
- Case studies
- Broad based group: AASHTO, FHWA, states, SAE



FHWA Analysis of ARTIMIS Data



Feedback to Other ITS Systems

- ARTIMIS archived data plan will be the blueprint for both Kentucky and Ohio ITS system
- Other ITS systems “watching” ARTIMIS:
 - TRIMARC - Louisville Freeway Management System
 - Columbus Freeway Management System
 - Central Kentucky Congestion Management System



Future Activities

- Implement New ARTIMIS Archived Data Plan: data formats, web page, GIS coverage, new equipment (?)
- Use of Mobility Performance Measures
- Feedback to other ITS Regional Management Systems
- Expansion of ARTIMIS: more interstate plus major arterial (US 25/US 42)

The Partners

- **ODOT:** David Gardner, Traffic Monitoring; George Saylor, ITS
- **KYTC:** Rob Bostrom, Archived Data; Dan Inabnitt, Traffic Monitoring; Nancy Albright, ITS
- **OKI:** Dory Montazemi, ITS
- **FHWA:** Ralph Gillman and Jeff Patten, Traffic Monitoring
- **City of Cincinnati**
- **TRW:** Scott Evans, ARTIMIS Project Manager



Conclusion

- ⌚ Thank you for your attention!
- ⌚ If you have questions or comments, please send email to:
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